DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AEROSPACE DEFENSE COMMAND
PETERSON AIR FORCE BASE, COLORADO 80914

31 JUL 1979

Honorable Gerald P. Dineen
Assistant Secretary of Defense (C^3I)
Room 3-E-1014, Pentagon
Washington, D.C. 20301

Dear Dr. Dineen

Thank you for taking time out of your busy schedule to see me without an appointment and for a very cordial visit. Our discussions were fruitful and I appreciate hearing your views and receiving your support on two programs that are critical to the missions of NORAD and ADCOM, the Ballistic Missile Early Warning System (BMEWS) and the Defense Support Program (DSP).

As a result of our discussions, I am taking the liberty of enclosing a summary paper on each of these programs. With respect to the BMEWS Modernization issue, the modernization program is the preferred option due to the projected implementation schedule and cost differences. For DSP, survivability remains a key issue and additional emphasis is needed to provide interim solutions to fill the void prior to Mobile Ground Terminal operations.

Yours truly

JAMES E. HILL, General, USAF
Commander in Chief

2 Atchs
~~1. BMEWS Paper (S)~~
2. DSP Paper (S)

(Attachment 1 not available.)

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DEFENSE SUPPORT PROGRAM (DSP)

A. Satellite Evolutionary Development (SED) vis-a-vis MOSAIC Sensor Program (MSP)

1. SED. The requirement for SED is based on the study "Mission Analysis for Missile and NUDET Surveillance" conducted jointly by ADCOM and SAMSO in 1974 and 1975. The SED program, although it does not completely fulfill all data requirements, does provide a hedge against continuing use of the 1960s technology of DSP by providing a series of improvements to the current DSP system starting in 1982.

a. Improved Focal Plane. With SED, the number of infra-red cells will be increased b/

b. Improved NUDET Information. An b/ will increase NUDET location capability

b/

An advanced radiation detector will provide longer life expectancy for NUDET capability on each DSP satellite.

c. Improved On-Board Data Processing. The current data processing electronics system is hard-wired such that critical component failure is equal to total satellite failure. The SED program substitutes a signal electronic programmable processor which will allow programming around a partial or sub-component failure and continuing to perform some warning functions. b/

The on-board central control unit will be more capable and flexible (via ground commanding) in filtering insignificant data and preventing the loss of significant data.

(d) Improved Satellite Life. The previously identified SED improvements, along with new [illegible] thermal control equipment, are designed to increase life expectancy for an [illegible] DSP satellite b/

Survivability is also enhanced over current satellites by additional satellite hardening and structural [illegible] for Shuttle deployment.

e. Ground Station Change: The SED program includes attendant upgrades to ground stations to accommodate the changes to satellites, such as a 3-4 fold increase in processing speed, a three-fold increase in computer memory, and upgraded operational software.

2. MSP. The MOSAIC Sensor Program takes advantage of 1970s technology to provide better area coverage from a single satellite, detection of lower intensity missile launches, and may offer some protection against b1 through the use of a wider bandwidth in the frequency spectrum (two frequencies: b1 on-board elimination of static, non-moving signals, and the use of b1 filters. The MOSAIC technology calls for a faster sampling rate and should lead to detecting and reporting information on b1 and others on a real-time basis.

SED vs MSP. The two programs should be viewed as complimentary rather than competitive. The SED program has been approved and offers some significant improvements for performing the worldwide warning mission in the near term. The MOSAIC Sensor Program offers the potential for significant enhancement over current DSP design (and the SED program) and should be pursued. However, the MSP is a higher risk program in the areas of focal plane development costs, light-weighting optics capabilities, and processing routines that provide detection and stereo tracking of a mass of b1 If any of these contingencies prevent or delay the MSP satellite program, the SED will continue to provide enhanced warning capability until the MSP or a suitable follow-on system is developed.

B. Worldwide Coverage Mission. b1

Today DSP satellites are positioned to provide warning of intercontinental ballistic missiles from the Soviet Union and sea-launched ballistic missiles directed at the United States. To provide truly worldwide warning, such as for a NUTS scenario, will require the SED program b1 and the addition of on-orbit satellites to provide full worldwide coverage.

b1

C. Peacetime Survivability. Minimum survivability of the Defense Support Program system during peacetime was identified in ADCOM Required Operational Capability (ROC) 3-77. The Requirements Review Group (RRG) validated ROC 3-77 but did not support the Simplified Processing Station (SPS) as a solution. The RRG determined that the SPS is too costly, and as a result, the Air Staff defined a near-term solution: a single-string prototype SPS, b1 and the conversion of the logistics support module into an operational support module using SPS hardware and software. For the long-term solution, Mobile Ground Terminals are envisioned based on SPS technology. Current status: The requirement for peacetime survivability

has been validated by the RRG, but only the prototype SPS will be available in the near term with the Operational Support Module programmed for December 1981. b1

D. Ground Communications Network (GCN) Upgrade (GCN III)

1. Requirement. b1 to accommodate additional data sources and potential users of DSP information, and to provide back-up communications to preclude a complete system outage from hostile or non-hostile communications outage. To ease funding difficulties, the requirement was broken into three phases of improvement.

a. Baseline Improvements. b1 summarization of event messages to airborne users, and the capability to eliminate duplicate event reports from specific area within coverage. Also included are manual/dial AUTOVON backup capability for ground communications segments, UHF backup capability for airborne communications segments, and advanced data communications control procedures (ADCCP) protocol internal to the DCP system.

b. Near-Term Improvements. The GCN III near-term improvements include automatic re-configuration control, the capability for rapid restart, the capability to transmit low speed manual data messages, and the capability to run user generated exercises and to stress the system for personnel training and system exercise.

c. Far-Term Improvements. The GCN III far-term improvements are designed for growth and increased capability for the DCP system. Improvements specifically identified include the capability to eliminate duplicate reports on an event-by-event basis (only area duplicate report elimination in baseline improvements), interface with Defense Satellite Communications System satellites for communications survivability, and a "blue-suit" capability for computer software maintenance and modification. Included also are automatic/pre-dialed AUTOVON capability, ADCCP protocol from communications elements to the users, b1 to retain GCN III technology.

2. Current Status. Funding for the baseline improvements is limited to FY 79/80 funds in the amount of $12.1M. The request for proposal went to Technology Development Corporation (a minority business based in Sunnyvale, California, which has a production facility in Arlington, Texas), and has resulted in a cost offer of $14.2M on 2 Jul 79 for baseline requirements only. The Air Force is facing a contract target date of 16 Aug 79 with a shortage of $2.2M between funding and contractor offer. SAMSO is currently working this problem to maintain the target date of January 1982 for delivery of the first communications element of GCN III.

E. Mobile Ground Terminal (MGT).

1. Requirement. A joint Generalized Operational Requirement, ADCOM/SAC GOR 205-78, identified the need for systems which can detect missile launches and NUDETS, process the information and communicate reports to command centers in near real-time (b1)
The MGT concept is a result of this requirement although ADCOM/SAC GOR 205-78 has not been validated.

2. MGT Concept. The MGT is a truck-mounted, single-string (one satellite to one ground station) DSP processing station which will be capable of (b1)
The initial deployment (b1)
which would be capable of direct communications to users through DSCS satellites or UHF. A System Operational Concept, written at Air Staff program management direction is in final ADCOM coordination prior to publication and concludes that operations, command and control, and logistic support will be very complex.

3. Operational Issues. Although the MGT is the third alternative solution identified in ADCOM/SAC GOR 205-78, there are hard operational issues remaining.

a. (b1)

b. (b1)

c. Command and Control. The ability of the MGT to communicate (b1) The required (b1) data updates may not be received due to communications disruption.

d. Logistics. Billeting and dining facilities for remotely deployed personnel, assuming operations are conducted away from military installations, will be a major problem, particularly during overseas deployments. A convoy of trucks, such as for a mini-bare-base deployment, would solve the logistics problem, but allow the enemy greater ease in detecting deployment location.